

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventors	: Juha TRINEN et al.	)	<b>U.S. Patent No. 6,988,745</b> <b>Issue Date: January 24, 2006</b>
Appln. No.	: 10/607,972	)	
Docket No.	: P23902	)	
Customer No.	: 7055	)	
Filed	: June 30, 2003	)	
Title	: GRIP FOR A SPORTS POLE, AND A SPORTS POLE HAVING SUCH GRIP	)	

**CITATION OF PATENTS IN PATENT FILE PURSUANT TO 37 CFR §1.501  
BY THE PATENT OWNER**

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The patent owner of the above-captioned patent herewith presents, for entry into the file record of such patent, the two patents identified below. A copy of each patent is attached.

Pursuant to MPEP 2205, the patents are pertinent for having been made of record in a continuing application of the above-captioned patent, i.e., U.S. Patent Application No. 11/219,754.

U.S. Patent No. 4,775,168 (DALEBOUT), issued on October 4, 1988;

U.S. Patent No. 5,123,674 (BAGNERES et al.), issued on June 23, 1992.

Respectfully submitted,

  
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# United States Patent [19]

## Dalebout

[11] Patent Number: 4,775,168  
[45] Date of Patent: Oct. 4, 1988

- [54] **SKI POLE**  
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[21] Appl. No.: 931,415  
[22] Filed: Nov. 14, 1986  
[51] Int. Cl.<sup>4</sup> ..... A63C 11/22; A63C 11/24  
[52] U.S. Cl. .... 280/821; 280/822; 280/824  
[58] Field of Search ..... 280/819, 821, 822, 824; 24/197, 590; 135/65

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### [57] ABSTRACT

A ski pole has a handle adapted to urge the shaft forward during a pole plant. The handle has a finger grip attached to the pole and a palm element pivotally connected to the top of the finger element. A spring biases the finger element away from the palm element. The handle may be equipped with a strap that aids in transmission of downward force from a hand to the ski pole. This strap also is adjustable and provides for quick safety release. The ski pole may also be provided with a basket that universally pivots on the bottom of the shaft.

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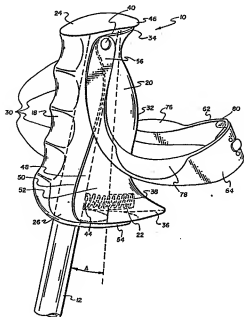
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16 Claims, 5 Drawing Sheets





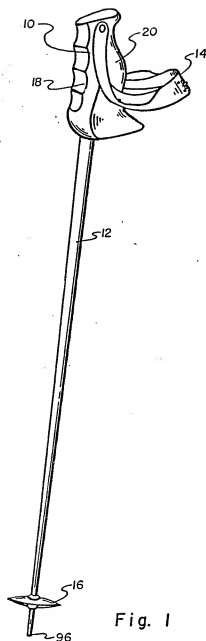
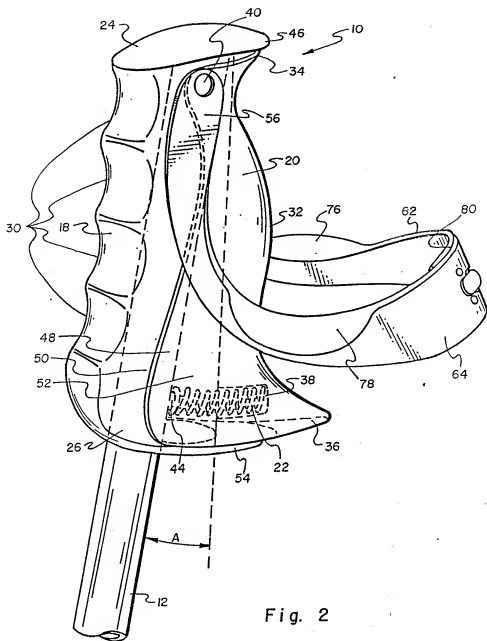
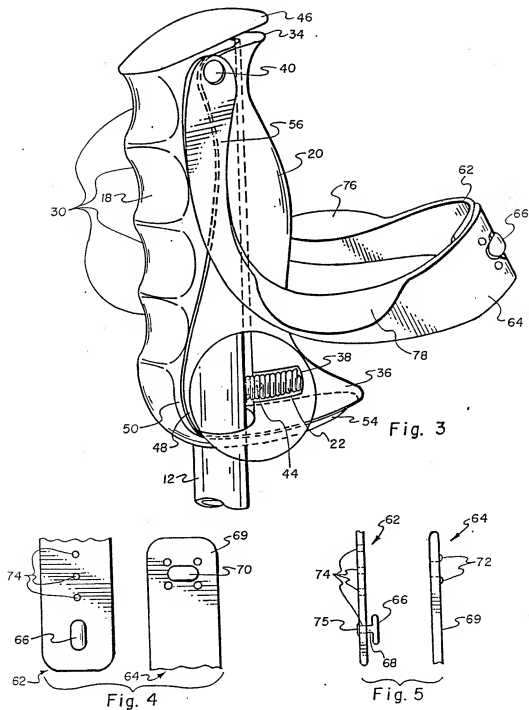


Fig. 1

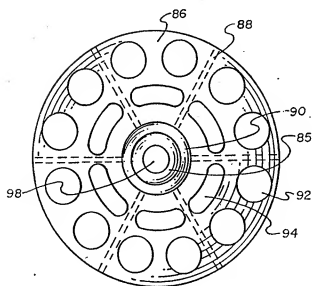
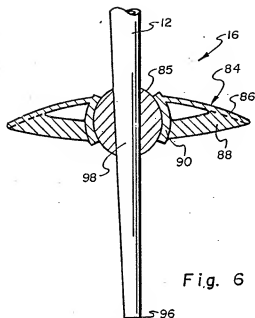














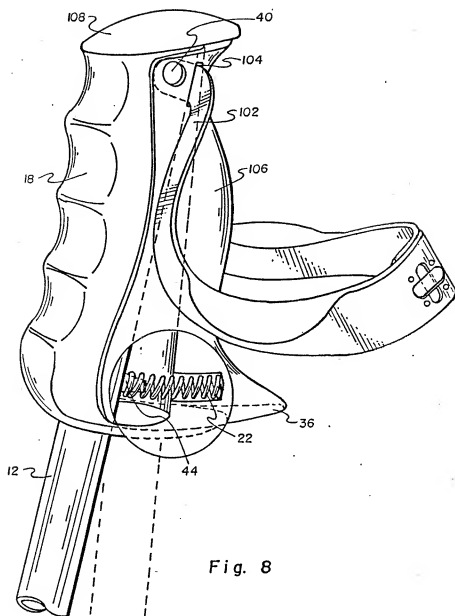


Fig. 8



## SKI POLE

## BACKGROUND OF THE INVENTION

## 1. Field

This invention relates to ski poles. It is particularly directed to a ski pole with a handle that urges shaft to a forward angle to assist a skier in achieving a forward reaching pole plant.

## 2. State of the Art

Standard ski poles typically comprise a roughly cylindrical handle rigidly connected to a straight shaft and a basket rigidly connected to the bottom of the shaft. A common problem with skiers is that they do not plant their ski poles far enough forward. With a straight rigid shaft and handle, it requires a somewhat unnatural or uncomfortable movement of the wrist for the skier to swing the basket far enough forward to achieve a proper pole plant.

There are ski poles that have an offset bend in the shaft near the handle oriented so that the shaft angles forward from the handle. This forward offset causes the basket of the ski pole to be planted farther forward of the skier than is ordinarily the case with poles having a straight shaft. One such pole carries the trademark Kerna, and is manufactured in Sallanche, France under authority of Warrington, Inc., of Lachine, Quebec, Canada.

In other ski poles the shaft is straight, but the handle itself has a broad enough cross section to allow the shaft to be positioned within the handle at a forward angle.

Both of these types of forward-angle poles, however, are rigid. They retain the same shape throughout the entire swing of the pole, thereby presenting a forwardly-angled pole at times when the forward reaching characteristic may be either unneeded or awkward.

When a pole is planted the skier's arm transfers considerable force to the ski pole over a very short period of time. To help absorb some of the "shock" of the pole plant there are ski poles that have a spring mounted along the length of the pole so that the handle travels up and down along the length of the pole. One such shock absorber pole is made by Allsop, Inc. of Bellingham, Wash.

The effectiveness of the transfer of downward force from hand or wrist to ski pole depends to some extent on the shape of the handle and the existence and shape of a grip or strap associated with the handle. Many ski poles have leather or other straps that encircle the wrist. These straps may aid in the transfer of downward force; however, they are typically flat belts and may not be comfortable or effective in such transfer of force.

In addition, common plastic baskets have notches or extensions around the outer perimeter of the basket which may catch on trees or twigs. One basket design is one in which the basket is comprised of a circular metal loop with flexible straps connecting the loop to the shaft. These hoop and strap baskets have a smooth outer perimeter, but may have spaces between the straps that may catch on trees or twigs.

Another problem in executing pole plants is that occasionally as a skier attempts a pole plant where the shaft is at an oblique angle to the snow, the basket may keep the tip of the pole from driving into the snow, and the pole plant may be "missed." This problem is particularly evident with common plastic baskets that may become stiff in lower temperatures. Certain ski poles, however, have baskets mounted pivotally to the shaft to

permit the basket to pivot universally on the shaft. Hoop and strap baskets also effectively pivot relative to the shaft.

## SUMMARY OF THE INVENTION

The present invention provides a ski pole with a handle that functions to swing the basket end of the shaft forward, thereby to provide a more forward reaching pole plant. As a skier brings the pole forward, a mechanism within the handle acts to adjust the angle between the skier's wrist and the shaft. The handle thus operates as a "wrist assist." As the wrist is pivoted or cocked to plant the pole, the spring in the handle causes an added cocking or pivoting of the shaft so that the basket swings farther forward, which may eliminate much of the wrist cocking. After the plant, as the skier approaches the pole, his wrist naturally resumes its normal "uncocked" position, and the handle changes configuration to provide a more typical angle between the skier's wrist and the shaft.

An additional advantage of the ski pole handle of this invention is that as the pole is planted, an internal spring in the handle may act to absorb some of the shock of the pole plant. This shock-absorbing feature may be of particular advantage on hard packed snow or ice. The handle of this invention may have more effective shock absorbing characteristics than the poles with a spring mounted along the length of the pole, because the spring of the present invention acts to absorb shock generally in the direction the skier is traveling as the pole is generally upright.

The handle is typically bifurcated at a pivot connection, with one portion connected to the shaft. The handle may thus carry adjustment means enabling the user to adjust the amount of forward cant angle the ski pole achieves in use.

The ski pole handle of this invention may also have a strap which is particularly adapted to transfer downward force from the wrist and hand to the ski pole. This strap may be formed with surfaces which function to bias the hand against the handle and contoured surfaces which receive the lower portion of the hand or the wrist. These surfaces are formed so that as the hand and wrist move downward, force is transferred to the handle through the contact between hand and handle or directly from the hand or wrist to the strap, which then transfers force to the pole. This strap may also be adjustable in length and may provide for a quick release of the strap when significant lateral force is applied to the strap.

In this specification downward force refers to forces along the major axis of the shaft of the ski pole and in the (direction from the handle toward the basket. This definition contemplates that a skier, for example, when skiing on the side of a hill, may plant a pole and exert "downward force" at a considerable angle from the vertical. Lateral forces refer to forces perpendicular to the major axis of the shaft.

The basket may be pivotally connected to the bottom of the shaft. This pivotally mounted basket may work in conjunction with the pivoting action of the handle to maintain the handle and basket in roughly stationary rotational orientations, while, in effect, the pole rotates between them. This configuration may provide a more smooth and flowing pole swing. A swivel connection may be fashioned as a ball and socket arrangement.



In a typical ski pole of this invention, a handle includes a finger grip fashioned with a cylindrical bore adapted to receive a ski pole shaft. The finger grip may have smooth rounded detents on the front face adapted to register with fingers. A palm grip is pivotally connected to the top of the finger grip to extend down from the pivot point opposite the front face of the finger grip. A spring may be positioned between the finger and palm grips to bias the finger grip away from the palm grip. A ski pole shaft is positioned within the cylindrical bore of the finger grip and firmly connected thereto. A snow basket is attached to the bottom of the shaft, preferably ball and socket joint.

As a skier grasps the handle, the fingers wrap around the finger grip; the palm grip is positioned in the palm area of the hand. As the palm and fingers are closed together, the finger and palm grips are brought together until the palm grip contacts the finger grip. At this point, the handle resembles a typical roughly cylindrical ski pole handle. As the handle rests in the hand and the fingers are relaxed, the spring acts to push the finger grip, which contains the shaft, away from the palm grip. Thus, as the skier pivots or cocks his wrist forward and relaxes his fingers, the spring pushes the shaft to its forwardly canted position in preparation for the pole plant, thus limiting the required amount of wrist cocking.

The palm grip has a lower flared section which offers resistance against the hand as it moves downward on the handle. This lower flared section aids in the transfer of downward force from the hand to the ski pole.

The palm grip also has an upper flared section which tends to restrain the hand from sliding up and off the handle. This upper flared section also interferes with an upper portion of the finger grip when the handle is in the open position. This interference establishes the maximum distance the palm and finger grip may be biased away from each other. Alternatively, the handle may be provided with an adjustment means so that the maximum achievable cant angle may be adjusted. This adjustment means may be comprised, for example, a turn screw arrangement.

A strap is connected near the pivoting axis of the palm and finger grips. A portion of the strap which is positioned to register with the lower portion of the hand is flattened and contoured, so that the hand may effectively transfer downward force to this contoured portion of the strap. The strap is also sized so that the back portion of the strap registers with the back of a hand, thereby biasing the palm area of the hand against the palm grip of the handle.

#### DESCRIPTION OF THE DRAWINGS

FIG. 1 is a side view of a ski pole of the invention;  
FIG. 2 is a side view of a handle of the invention in an open position;

FIG. 3 is a side view of a handle of the invention in a closed position;

FIG. 4 is a front view of a strap fastener of the invention;

FIG. 5 is a side view of a strap fastener of the invention;

FIG. 6 is a cross-sectional view of the basket 16 of FIG. 1;

FIG. 7 is a top view of the basket 16 of FIG. 6; and

FIG. 8 is a side view of an alternative embodiment of the handle and strap of the invention.

#### DETAILED DESCRIPTION OF THE DRAWINGS

Referring to FIG. 1, a ski pole of the invention comprises a handle 10, a shaft 12, a strap 14, and a pivoting basket 16. Referring to FIG. 2, the handle 10 is comprised of a finger grip 18, a palm grip 20, and a spring 22. The finger grip 18 is an elongated body composed of durable rubber or plastic. It has a top 24 and a cylindrical bore 26 which is adapted to snugly and securely receive the ski pole shaft 12. The finger grip 18 has four rounded detents 30 which are adapted to receive the fingers of a hand.

The palm grip 20 is composed of a rigid material such as hard plastic. It has a bulged section 32, an upper flared section 34, a lower flared section 36, and a cylindrical bore 38. The palm grip 20 and finger grip 18 are pivotally connected by means of two self tapping screws 40, as shown. As shown, the palm grip 20 and finger grip 18 are of approximately the same length.

The bulged section 32 is sized and positioned to be placed within the palm of a hand when the handle is in use. The upper flared section 34 is adapted to preclude a hand from slipping upward and off the handle 10 when it is in use. The lower flared section 36 is adapted to preclude a hand from slipping downward and off the handle 10 when the handle is in use.

The spring 22 is placed in the bore 38. The spring 22 connects with the knob 44 of the finger grip 18 as shown and biases the finger grip 18 away from the palm grip 20. As the finger grip 18 reaches its maximum distance from the palm grip 20, the upper flared section 34 of the palm grip 20 interferes with the ridge 46 of the finger element 18. This interference stops further pivoting of the finger grip 18 with respect to the palm grips. The maximum forward cant angle  $A$  of the pole is thus preselected. The finger grip 18 may also be biased toward the palm grip 20, compressing the spring 22, in which event the handle assumes a more nearly cylindrical shape as depicted in FIG. 3.

The sides 48 of the palm grip 20 and the sides 50 of the finger grip 18 associate in a close fit relationship. As shown in FIG. 3, the sides 48 of the palm grip are sized so that when the handle 10 is in its closed position, the sides 48 do not interfere with the detents 30 (FIG. 3), yet are large enough to remain in registration with sides 50 when the handle 10 is in its open position (FIG. 2).

An elongated tongue 54 projects from the bottom of the finger grip 18 toward the flared section 36 as shown. The tongue 54 covers the bottom of the interior chamber 52 as the handle 10 moves between its open and closed positions. The combination of the sides 48 and 50 and the tongue 54 effectively seal the interior chamber 52 from exposure to snow or other unwanted debris and also prevents a skier's hand or glove from being caught or pinched as the elements of the handle 10 pivot.

FIG. 2 illustrates a strap 56 connected to the handle 10 by means of two self tapping screws 40. The strap 56 includes a male belt portion 62 and a female belt portion 64. As best shown by FIGS. 4 and 5, the male belt portion 62 includes an oval appendage 66 which is firmly attached to the male belt portion 62 by means of a neck 68. The female belt portion 64 has a bottom piece 69 with an oval slot 70 and four knobs 72.

The strap 56 is fastened by rotating the male belt portion 62 approximately 90° from the orientation shown in FIG. 4. The oval appendage 66 is then placed within the oval slot 70. The male portion 62 is then



rotated back to its original orientation and the oval appendage rests a top the bottom piece 69 and between the knobs 72. This fastened orientation is illustrated in FIGS. 2, 3, and 8.

The male belt portion has a plurality of cylindrical holes 74 which are adapted to receive the appendage 66. The length of the strap 56 when fastened may thus be adjusted by selecting the appropriate hole 74 to which to attach the appendage 66. The appendage is firmly fixed to the male belt portion 62 by a self tapping screw 75. Alternatively, the female belt portion may have a plurality of slots 70 so that a skier can adjust the length of the strap 56 by simply selecting the appropriate slot 66 in which to place the appendage 66.

Both belt portions (62 and 64) have contoured portions 76 and 78, which are formed and adapted to receive a lower hand area and/or wrist as the pole is in use. The strap 56 is of such a length that the back 80 of the strap 56 will offer resistance against the back of a hand and/or wrist to bias a palm area of a hand against the palm grip 20. The sizing of the strap takes into account typical gloves or mittens which may be worn by a skier. The appendage 66 is preferably made of hard plastic. Other portions of the strap 56 are preferably made of a flexible but moldable material such as soft polyurethane.

FIG. 6 is a cross-sectional view of the basket 16. It is comprised of a cup 84 and a ball 85. The cup is comprised of a domed section 86, a plurality of ribs 88, and a socket 90. The domed section 86 forms an inverted bowl, as shown, for providing resistance against snow. As shown in FIG. 7, section 86 has a circular outer perimeter. Domed section 86 also has a plurality of circular holes 92 and elongate holes 94 which make the domed section 86 lighter in weight. Enough surface area is left in the domed section 86 so that the cup 84 will offer effective resistance against a snow surface.

The ribs 88 connect between the socket 90 and the domed section 86 and give strength to the domed section 86. The socket 90 universally pivots on the ball 85. The ball 85 connects with the shaft 12 near tip 96 at the truncated conical hole 98 in the ball 85 as shown. The cup 84 is formed of a light rigid material, preferably urethane. The ball 85 is formed of a smooth hard substance, preferably nylon. The ball 85 is press fit in place on the shaft 12.

FIG. 8 illustrates an alternative embodiment of the handle and strap of the invention. Rather than connect on the outside of the palm grip as depicted in FIGS. 1-3, the strap 102 extends through slots 104 in the palm grip 106 and connects to the handle 108 by the self tapping screws 40 as shown. The palm grip 106 thus adds strength to the connection between the strap 102 and the handle 108.

The ski pole of this invention functions as follows: As a skier swings the pole forward and cocks his wrist to execute a pole plant, he naturally releases tension on the finger grip 18 with his fingers. The spring 22 then pushes the finger grip 18 away from the palm grip 20. The back 62 of the strap biases the skier's hand against the palm grip 20. The skier's palm offers resistance against the palm grip 20 and the shaft 12 is thrust forward at a forward angle relative the palm grip 20. This forward angle assists the skier in achieving a more forward pole plant.

As the pole is planted the finger grip 18 and the palm grip 20 begin to collapse toward each other. The spring 62 thus helps absorb the shock of the pole plant.

As stated, the back 62, of the strap biases the skier's hand against the palm grip 20, thus causing more friction resistance between the hand and the handle 10 as the skier's hand is thrust downward. In addition, the lower portion of the hand registers with both the lower flared section 36 of the palm grip 20 and the contoured portions 76 and 78 of the strap 56. These registrations also provide effective means for transfer of downward force from hand to ski pole.

After the pole is planted in the snow, the skier approaches the position where the pole is planted. The skier's palm will continue to offer resistance against the palm grip 20. The palm grip 20 and the finger element 18 will then collapse back to the closed position, as illustrated in FIG. 3. The skier has control over the rate at which the finger grip 18 and palm grip 20 collapse on each other by the inward force he exerts with his fingers against the finger grip 18 and by the orientation of his wrist. Once the skier travels past the position where the basket 16 has been planted, the skier may pull the basket up out of the snow and the pole is ready for the next pole plant.

The pivoting basket 16 works in conjunction with the handle 10. As the pole is planted, the basket 16 pivots to match the snow contour. As the skier moves forward, the shaft 12 pivots on the basket 16 and the shaft 12 also pivots with respect to the palm grip 20. The wrist is allowed to be more rotationally stationary, and the pole effectively pivots between the basket 16 and the wrist.

The pivoting basket 16 also helps preclude the skier from "missing" a pole plant. If a skier attempts a pole plant with the shaft at an oblique angle to the snow, such as planting down hill on a steep slope, the basket will pivot sufficiently to allow the tip 96 of the pole to penetrate the snow. After the tip penetrates the snow, the basket will register with the snow and the pole plant may be executed.

Another advantage of the basket 16 is that it is adapted to avoid catching on trees or bushes. The smooth outer perimeter of the domed section 86 and the relatively small size of the plurality of holes 92 and 94 help preclude the basket 16 from becoming entangled in trees or bushes. Yet the basket 16 retains the advantages of lightness and durability. Many skiers may also find baskets within the contemplation of the embodiment of FIGS. 6 and 7 more aesthetically pleasing than commonly encountered baskets.

The strap 56 has a quick release characteristic. If the strap undergoes significant lateral force, such as during a hard fall, or catching on trees or twigs, the appendage 66 breaks free of the selected slot 70 and the ski pole is then disconnected from the skier's wrist. Movement of the wrist under many such circumstances naturally tends to rotate the belt portions 62, 64 with respect to each other, bringing the oval appendage 66 into registration with the oval slot 70, thereby facilitating their disconnection. Alternatively, the user can intentionally quick release the strap by wrenching or twisting the strap vigorously. Such a quick release might be necessary, for example, at the top of a ski lift or after a fall in deep snow.

Another advantage of the handle 10, strap 14, and basket 16 is that they can be economically attached to existing shafts. A pair of handles 10, straps 14, and baskets 16 could be sold as a kit. A skier could purchase the kit, remove the handles and baskets from poles he already owns, and attach the handles to his old shafts at the cylindrical bore 26 of the handle and at the trun-



cated conical hole 98 in the ball 85. Suitable cement or glue may be used to hold the pieces together.

Reference herein to details of the illustrated embodiment is not intended to restrict the scope of the appended claims, which themselves recite those features regarded as essential to the invention.

I claim:

1. A ski pole comprising:

a handle with a top end and a shaft-receiving bottom end, said handle including:

first and second elements pivotally connected to each other about a transverse axis near said top end, the first of said elements including said bottom end of said handle, and

biasing means for urging the second of said elements away from said bottom end; said second element having a bulged section sized and positioned to receive the palm of a user's hand and a shaft with first and second ends, with said first end placed within and firmly connected to said bottom end of said handle.

2. A ski pole according to claim 1, wherein said first element has a plurality of detents adapted to receive the fingers of a hand.

3. A ski pole according to claim 1, wherein said handle further comprises a lower flared section formed on said first section near said bottom end, which is adapted to aid in the transfer of downward force from a hand to said handle.

4. A ski pole according to claim 1, further comprising a strap for connection of said handle to a wrist, said strap having a back portion for biasing a palm against said handle and contoured portions formed and adapted on said strap to receive the lower portion of a user's hand as said pole is in use and for transmitting downward force from said hand to said handle.

5. A ski pole according to claim 4, wherein said strap has fastening means for fastening said strap and for releasing when a preselected amount of lateral force is exerted on said strap.

6. A ski pole according to claim 5, wherein said fastening means comprises:

a first belt portion having a first longitudinal axis and a raised appendage having a longer axis parallel said first longitudinal axis; and

a second belt portion having a second longitudinal axis with a slot with a longer axis transverse said second longitudinal axis.

7. A ski pole according to claim 6, wherein said second belt portion has a plurality of said slots for adjusting the length of said strap.

8. A ski pole according to claim 6, wherein said appendage has a plurality of selectable positions upon said first belt portion for adjusting the length of said strap.

9. A ski pole according to claim 1, wherein said handle has adjustment means for adjusting the distance that said second element may be biased away from said first element.

10. A ski pole according to claim 1, further comprising a basket pivotally connected to said second end of said shaft.

11. A ski pole according to claim 10, wherein said pivotal connection is a ball and socket arrangement.

12. A ski pole according to claim 10, wherein said basket further comprises a rigid dome having a generally smooth outer perimeter.

13. A ski pole according to claim 12, wherein said dome has a plurality of holes which are small relative to the size of said dome.

14. A ski pole according to claim 10, including a basket connected to said second end of said shaft, said basket comprising:

a rigid dome having a smooth outer perimeter and a plurality of holes which are small relative to the size of said dome; and

a ball and socket connection between said basket and said ski pole.

15. A ski pole according to claim 14, further comprising a plurality of ribs connected to said dome to add strength thereto.

16. A ski pole according to claim 14, wherein said basket has a circular outer perimeter.

\* \* \* \* \*





US005123674A

## United States Patent [19]

[11] Patent Number: 5,123,674

Bagneres et al.

[45] Date of Patent: Jun. 23, 1992

[54] SYSTEM FOR LINKING A SKI POLE TO A SKIER'S HAND

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[73] Assignee: Salomon S.A., Annecy Codex, France

[21] Appl. No.: 727,949

[22] Filed: Jul. 10, 1991

## Related U.S. Application Data

[63] Continuation of Ser. No. 383,043, Jul. 21, 1989, abandoned.

## [30] Foreign Application Priority Data

Jul. 21, 1988 [FR] France ..... 88 10159

[51] Int. Cl.<sup>5</sup> ..... A63C 11/22

[52] U.S. Cl. .... 280/821; 280/822; 2/160; 2/161 A

[58] Field of Search ..... 280/816, 819, 821, 822, 280/809; 2/158, 159, 160, 161 R, 161 A, 162, 163

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Primary Examiner—Andres Kashnikov  
 Assistant Examiner—Richard Camby  
 Attorney, Agent, or Firm—Sandler, Greenblum & Bernstein

## [57]

## ABSTRACT

Apparatus and method for linking a ski pole to a hand of a skier. The apparatus has a hand cover that is placed over the hand of said skier. The hand cover includes a strap for transmitting forces of the skier to the ski pole. First and second connections secure the hand of the skier to a handle of the ski pole.

31 Claims, 3 Drawing Sheets

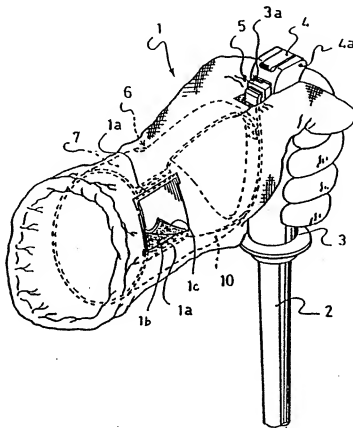
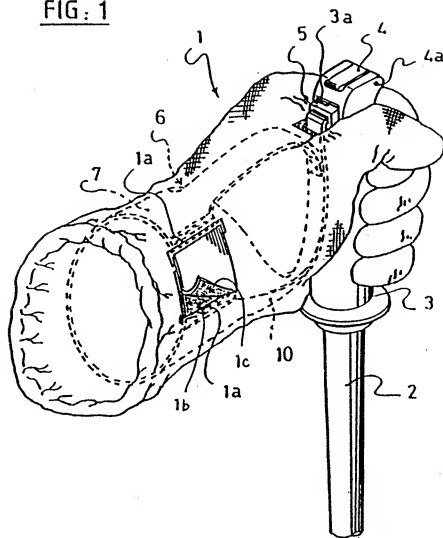




FIG: 1



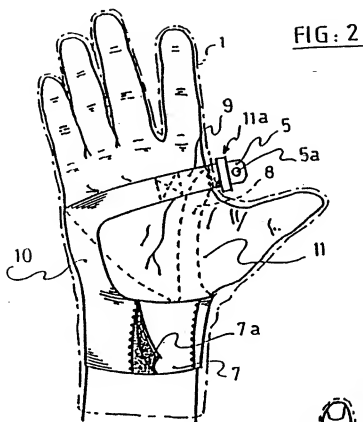
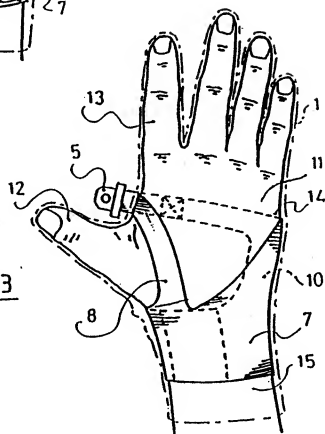
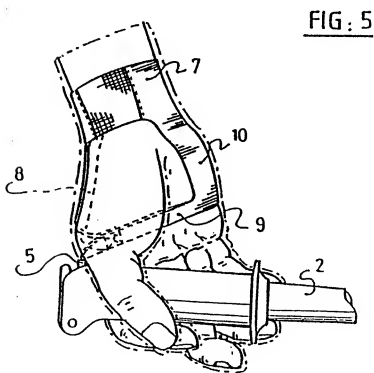
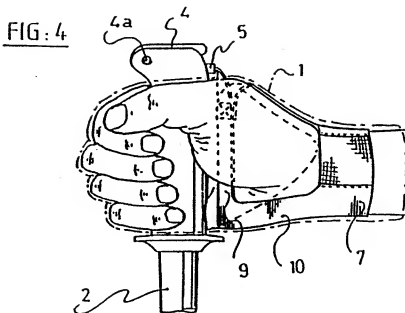


FIG: 3









# SYSTEM FOR LINKING A SKI POLE TO A SKIER'S HAND

This application is a continuation of application Ser. No. 07/383,043, filed Jul. 21, 1989, now abandoned.

## BACKGROUND OF THE INVENTION

### 1. Field of the Invention

The present invention is directed to an apparatus and method for linking a ski accessory, such as a ski pole, to a skier's hand.

### 2. Description of Background and Relevant Information

Skiers typically employ ski poles to increase their balance and maneuvering ability. The ski poles are usually manufactured such that they include a closed loop strap, known as a wrist strap, proximate the topmost portion of the ski pole. Such a strap permits the skier to avoid losing his pole if he unexpectedly opens his hand. In addition, the wrist strap improves the transmission of forces by the skier, particularly when the skier is leaning on the pole, either for making a turn (in downhill skiing), or for the stride or skating step in cross-country skiing.

To be efficient, the wrist strap must partially encircle the skier's wrist with the two end strands of the loop connected to the wrist passing along the palm of the hand. However, the majority of skiers, and particularly novice skiers, do not position the wrist strap at the proper location, reducing the benefits of using ski poles. Furthermore, when the wrist strap is not properly positioned around the wrist, the forces exerted on the hand by the ski pole are localized, which can lead to discomfort and trauma for the skier.

In addition, in certain situations, such as in cross-country skiing, wherein the ski pole is moved from a propulsion position to a return position, the conventional wrist strap does not prevent one from losing the ski pole.

Other problems arise from poor placement and sliding of the conventional type wrist strap during skiing, such as the inability to adjust the wrist strap with respect to the skier's hand and the lack of feedback from the ski pole when thicker than normal gloves are worn due to the inefficient coupling of the hand to the ski pole.

French patent 2,381,537 discloses a ski pole with a handle having a shape in which the skier's hand is linked to the ski pole by a magnetic coupling device that is provided on a glove worn by the skier and on the ski pole. However, such a system does not solve all the problems described above; particularly the problems of transmitting the skier's forces to the ski pole and of not losing the ski pole, because a sudden shock to the ski pole releases the magnetic coupling.

Accordingly, an object of the present invention is to overcome the above described problems and particularly, to furnish a system for linking a ski accessory, such as a ski pole, with the skier's hand.

## SUMMARY OF THE INVENTION

A linking assembly is provided according to the present invention, for linking a ski accessory, such as a ski pole, to a skier's hand. The linking assembly includes a hand cover in the shape of a glove, which is adapted to be slipped onto the skier's hand. The hand covering includes means for transmitting forces from the skier to

the ski pole. A first means for affixing, associated with the ski accessory, cooperates with a second means for affixing, associated with the hand cover, to secure the ski accessory to the hand of the skier. The second means for affixing associated with the hand cover is positioned proximate the point of intersection of a thumb and index finger of the hand of the skier.

The means for transmitting forces includes a strap or the like having a closed loop that is integrated into the hand cover, such that the second means for affixing is arranged on the strap and projects toward the ski pole.

An advantage of the present invention is the ability to adjust the position of the second means for affixing with respect to the location of the first means for affixing associated with the ski pole.

Another advantage of the present invention is that the fixation means associated with the ski pole is easily released from the fixation means associated with the hand covering when the skier has a mishap.

Yet a further advantage of the present invention is that a means for transmitting forces includes a cuff adapted to encircle the wrist of the skier's hand so as to provide an improved coupling of the hand to the ski pole.

The cuff may be adjustable in length to accommodate different size hands, and may be open to improve the comfort of the linking assembly.

The means for transmitting forces is designed to extend along the back of the skier's hand and connect the fixation means to the cuff and also extend along a sharp edge of the skier's hand into the cuff as well as along the palm of the skier's hand which connects the fixation means to the part of the cuff extending along the sharp edge of the skier's hand.

Another advantage of the present invention is the provision of a hand cover that contains means for transmitting forces and a fixation device that connects the hand cover to the ski pole.

Another advantage of the present invention is the provision of a ski pole that includes a fixation means that cooperates with a linkage system on a hand cover.

The present invention includes an apparatus for linking a ski pole, having a handle, to a hand of a skier. A hand cover, such as a glove, is placed over the hand of the skier. The hand cover includes a strap for transmitting forces of the skier to the ski pole. The strap forms a closed loop which is integrated into the hand cover. First and second affixing means secure the hand of the skier to the handle of the ski pole to transmit forces from the skier to the ski pole. The first affixing means is secured to the ski pole proximate the handle of the ski pole. The first affixing means is associated with the ski pole, while the second affixing means is associated with the hand cover.

Another advantage of the present invention is that the hand cover includes means for adjusting the hand cover to the hand of the skier.

A feature of the present invention is that the first means for affixing is arranged in a zone adapted to be proximate the intersection of a thumb and index finger of the skier's hand. In this arrangement, the first means for affixing may be arranged on said strap.

An aspect of the invention is that the position of the first means for affixing may be adjusted with respect to the second means for affixing.

Yet a further advantage of the present invention is that the first and second means for affixing are releasable from each other.



The present invention includes a cuff, which may be adjustable, that encircles a wrist of the skier's hand and transmits forces to the ski pole. Furthermore, the cuff may, be open and include two ends which are adapted to overlap each other so that the cuff can be adjusted to the size of the wrist of the skier. Means for gripping, such as a hook and loop fastener, secure the two ends together.

Another feature of the present invention is the inclusion of a band that extends along the back of the hand and connects the second means for affixing to the cuff. An extension may also be included that extends along a sharp edge of the hand to a band of the cuff. A second band may also be provided that extends along the palm of the hand and connects the second means for affixing to the extension. The two bands and extension are provided to facilitate the transmission of forces to the ski pole.

The present invention is directed to a linking assembly that includes a ski glove that is adapted to be linked to a ski pole, in which means for transmitting forces of a skier to the ski pole are provided along with means for affixing the transmitting means to the ski pole.

The linking assembly of the present invention links a ski glove having means for transmitting forces of a skier to a ski pole in which the ski pole includes means for affixing the ski pole to the transmitting means.

A method is disclosed for securing a ski accessory, such as a ski pole, to a hand of a skier. A first affixing means is placed proximate a topmost section of the ski accessory. A second affixing means, which may be adjustable, is positioned on the hand of the skier. The positioning of the second affixing means is then adjusted so that it is located proximate a point defined by the intersection of a thumb and index finger of the hand. Lastly, the second affixing means is secured to the first affixing means so that the ski accessory is secured to the hand of the skier.

The linkage assembly of the present invention secures a ski accessory, such as a ski pole, to a hand of a skier by providing a first means for affixing, which may be an opening, that is secured to a portion of the ski accessory, such as a handle of the ski pole. A cuff that may be adjustable is placed around a wrist of said hand and a band (that may also be adjustable) extend from the cuff. Second means for affixing, such as a tongue, are secured to the band and engage the first means for affixing, so as to secure the ski accessory to the hand of the skier. In addition, a hand cover, such as a glove, may be provided that is placed over the cuff and band. The second means for affixing is preferably located proximate a point defined by the intersection of a thumb and index finger of the hand.

If the cuff is adjustable, two end flaps are provided. One end flap may have a hook fastener while the second end has a loop fastener. The hook fastener is secured to the loop fastener to adjust the cuff to the wrist of the skier.

According to a method of the present invention, the second affixing means may be placed around a wrist of the hand of the skier. The second affixing means may include a cuff, which can be adjustable, that is placed around the wrist of the hand of the skier. In addition, the second affixing means can be a band, which may be adjustable, having a tongue that engages the first affixing means. The tongue is positioned proximate the point defined by the intersection of the thumb and index finger of the hand of the skier.

## BRIEF DESCRIPTION OF THE DRAWINGS

The invention is further explained in the description which follows, with reference to the drawings illustrating, by way of a non-limiting example, an embodiment of the invention wherein:

FIG. 1 is a perspective view of a linkage system according to a preferred embodiment of the present invention, wherein the linking system is integrated into a ski glove;

FIG. 2 is a bottom view of a means for transmitting forces used with the linkage system of the present invention, wherein a hand covering that is placed over a skier's hand is shown in broken lines;

FIG. 3 is a top view of the means for transmitting forces shown in FIG. 2;

FIG. 4 illustrates a side view of the linkage system of the present invention for transmitting forces showing the position of the skier's hand in a leaning or propulsion phase of skiing, the hand covering being shown in broken lines; and

FIG. 5 is a view similar to FIG. 4 in which the ski pole is shown in a return phase.

## DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

A ski pole linkage assembly 20 according to the present invention includes a hand covering, such as a glove 1, which is designed to be slipped onto a skier's hand 11. Glove 1 includes means for transmitting the forces exerted by the skier to a ski pole 2. Glove 1 includes a first fixation means 5 that is intended to mate to a second fixation means 4 that is provided on handle 3 of ski pole 2. Such an assembly 20 makes it possible to provide an adequate linkage between the skier's hand 11 and ski pole 2 to insure that the transmitting forces exerted on ski pole 2 by the skier are transmitted to ski pole 2. Linkage assembly 20 eliminates the possibility of losing ski pole 2, even in cases where the skier releases his grip of handle 3 of ski pole 2.

Linkage assembly 20 of the present inventions is particularly advantageous to skiers who do not position conventional type wrist straps at the correct location with respect to the skier's hand, resulting in an inefficient transmittal of the skier's forces to ski pole 2, because fixation means 4 and 5 of the present invention will always be correctly adjusted for transmitting the skier's forces to ski pole 2.

Fixation means 4 and 5, associated with glove 1, which can be considered a part of the means for transmitting forces, are arranged in a zone adapted to be proximate the position of the intersection of the thumb and the index finger of the skier's hand, i.e., proximate the conjunction portion of the thumb and the index finger covering portions of the hand cover. Such an arrangement is desirable for cross-country skiing, since it makes it possible to place linkage assembly 20 proximate a center of rotation zone of ski pole 2 with respect to hand 11 during cross-country skiing.

According to a preferred embodiment, the means for transmitting forces includes a cuff 7 that is adapted to encircle the wrist of the skier's hand 11. Such an arrangement permits a correct distribution of forces when the skier leans on ski pole 2 while making a turn in downhill skiing or in a propulsion phase operation in cross-country skiing. In addition, the means for transmitting forces includes a member that extends along the back of the skier's hand 11 and connects fixation means



4 and 5 to cuff 7 of glove 1, making it possible to maintain good control of ski pole 2 during a return phase operation in cross-country skiing.

Finally, the means for transmitting forces can include an attaching member that extends along one edge of the skier's hand 11, extending to cuff 7, to improve the skier's ability to transmit the forces to ski pole 2. The attaching member is adapted to extend along the palm of the skier's hand 11 to connect fixation means 5 associated with glove 1 to fixation means 4 associated with ski pole 2, to provide a better distribution of the forces that are exerted on ski pole 2.

Linkage assembly 20 according to the present invention is shown in FIG. 1. Linkage assembly 20 secures hand 11 of a skier (shown in FIG. 2) that is wearing the hand covering, such as a glove 1, to handle 3 of a ski pole 2.

Linkage assembly 20 includes a strap 6, or the like, which is integrated into glove 1 for transmitting to ski pole 2 the forces exerted by the skier. Glove 1 is selectively secured to handle 3 of ski pole 2 by a first fixation means 4 provided on the handle 3 of the ski pole and a second fixation means 5 provided on strap 6. The two fixation means 4 and 5 cooperate with each other.

In the preferred embodiment shown in FIGS. 1-5, second fixation means of strap 6 comprises a tongue 5 that projects towards the exterior of glove 1. Tongue 5 includes a hole 5a. Tongue 5 is introduced into an opening 3a in handle 3 of ski pole 2. The shape of opening 3a is designed to accept tongue 5.

First fixation means 4, which is associated with ski pole 2, comprises a cam 4 that is pivotally mounted at 4c. Tongue 5 is selectively locked by a means for locking (not shown), which is activated by pivotally mounted cam 4. Any suitable means for locking strap 6 to handle 3 of ski pole 2 can be used. In particular, it is possible to use a locking system having elastic spring linkages, since this has the advantage of unlocking in case of an accidental shock.

Second fixation means 5, associated with strap 6, is preferably positioned proximate a point 11a defined by the intersection of thumb 12 and index finger 13 of the skier's hand 11. Such a location is desirable because it makes it possible to place hand 11 of the skier and ski pole linkage assembly 20 at a mutual rotation zone position of hand 11 and ski pole 2 during skiing. This location is particularly desirable for cross-country skiing in order to eliminate or reduce problems associated with the sport, such as the occurrence of blisters on the skier's hand 11 from the sliding action of ski pole 2.

Several modifications can be made to linkage assembly 20 without diverging from the scope of the invention. For instance, a means for adjusting the length of fixation tongue 5 can be provided to adapt linkage assembly 20 to the skier's hand 11.

Strap 6 is manufactured from a material exhibiting a suitable strength for the job and which also can be easily tolerated by the skin of hand 11. For instance, strap 6 can be manufactured using the same material used to manufacture conventional type ski pole wrist straps.

Strap 6 can have the shape of a conventional wrist strap or of that described below in connection with the drawings, the essential element being that it ensures a good transmission of the forces between the user's hand 11 and ski pole 2.

As shown in FIGS. 2 and 3, strap 6 includes a cuff 7 which is intended to encircle a wrist 15 of the skier. Cuff 7 can form either a continuous loop whose dimension

corresponds to that of wrist 15, or it can be open. In the latter case, two ends 7a of cuff 7 are designed so as to extend out from hand covering 1 through slots 1a (see FIG. 1) provided therein. Two ends 7a are furnished with a means for gripping, such as a hook 1b and loop fastener 1c. Two ends 7a are closed by placing one end 7a over the other end 7a so that hooks 1b and loops 1c engage each other. Such an arrangement permits the cuff to be adapted to various sized wrists.

Cuff 7 extends laterally by an extension 10 that extends along sharp edge 14 of hand 11; i.e., the lateral portion of the hand opposite thumb 12. Extension 10 ensures that the forces exerted by the skier are properly distributed to ski pole 2, as will be explained in the description that follows.

Strap 6 includes a first band 8 that extends along the back of hand 11 (FIG. 3) to secure second fixation means 5 to cuff 7. As shown in FIG. 3, band 8 extends substantially along the journal zone of thumb 12 with the rest of hand 11 so as to not hinder movement of the hand.

Band 8 is adjustable in length, for example, by the use of a gripping means similar to that employed for cuff 7, so as to conform to the dimensions of the back of hand 11. This permits better precision in guiding ski pole 2. Band 8 should be as short as possible to avoid any play at the level of its fixation to handle 3 to obtain a better sensation of ski pole 2.

Strap 6 further includes a second band 9 that extends along the palm of hand 11 and secures fixation tongue 5 to extension 10 that covers sharp edge 14 of hand 11. Second band 9 indirectly connects fixation tongue 5 to cuff 7 along the palm of hand 11.

The operation of the various components of strap 6 for transmitting forces to ski pole 2 will now be explained with reference to FIGS. 4 and 5.

FIG. 4 shows the position of the skier's hand in a propulsion operation phase in which a skier leans on ski pole 2, such as might occur while cross-country skiing or negotiating a turn in downhill skiing. In this operation phase, the force exerted by the skier is essentially transmitted to ski pole 2 by cuff 7 and extension 10 of strap 6 covering sharp edge 14 of hand 11. Second band 9, between cuff 7 and fixation tongue 5, also participates in the transmission of forces to ski pole 2. Strap 6 transmits forces to ski pole 2 better than conventional wrist straps, because of a better distribution of forces on the surface of hand 11. Furthermore, such an arrangement results in fewer risks of injury or trauma to hand 11.

FIG. 5 shows the position of the skier's hand in a return operation phase. This operation phase follows the propulsion operation phase in cross-country skiing. The skier is projected forward by leaning on ski pole 2. During this phase, the skier must bring ski pole 2 back towards the front so as to be able to lean on it again.

It is usually during this operation phase that the skier, using conventional type wrist straps, loses the ski pole, because at this point there no longer is any holding force exerted on the ski pole, because the ski pole is only held by the ends of the skier's fingers, as shown in FIG. 5.

With linkage assembly 20 according to the present invention, band 8 of strap 6, which connects cuff 7 to ski pole 2 by means of fixation tongue 5, exerts a return retention force on ski pole 2. This guarantees that ski pole 2 will not separate from the skier, even though the skier is not applying a holding force to ski pole 2 with his fingers. In the return operation phase the various



components of strap 6 distribute the forces generated by the inertia of ski pole 2 to hand 11.

As can be seen, linkage assembly 20 according to the present invention makes it possible to solve the problems that plague conventional type wrist straps. Assembly 20 permits a good transmission of forces from the skier to ski pole 2. Additionally, the problem of how to position the wrist strap is solved. This feature is very beneficial to novice skiers. Furthermore, linkage assembly 20 equalizes and permits a regular distribution of forces, avoiding trauma and hand injuries. The present invention also avoids the problems connected with the relative rotation of ski pole 2 and glove 1 during cross-country skiing.

Integration of strap 6 into glove 1 enhances interfacing of assembly 20, without requiring any adjustment of strap 6, to hand 11. The interfacing can even be improved with the addition of a means for adjusting the location of the wrist via cuff 7 and the location of fixation means 5.

Assembly 20 according to the present invention also makes it possible to prevent losing ski pole 2, particularly in the return phase of cross-country skiing, since ski pole 2 is automatically brought back by hand 8.

Finally, the present invention permits the skier to obtain better feedback from ski pole 2, since the transmission of forces between the skier and ski pole 2 is positioned closer to the skin by integrating strap 6 within glove 1.

It should be noted that linking assembly 20 also promotes safe skiing by providing a releasable fixation means in the case of a shock to ski pole 2 or fall by the skier.

It is understood that the present invention is not limited to the embodiment shown in the drawings, which illustrate a non-limiting example. For example, glove 1 could be eliminated without affecting the operation of linking assembly 20. In such an embodiment, assembly 20 would merely comprise a sheath having an appropriate shape furnished with fixation means.

Alternatively, an additional covering can be provided between the skier's hand and the portion of the strap that transmits the forces to and from the ski pole 2.

Finally, any fixation means located between the portion that transmits forces to ski pole 2 and handle 3 of ski pole 2 can be used without diverging from the scope of the invention.

We claim:

1. An apparatus for linking a ski pole, having a handle, to a hand of a skier, comprising:

a hand cover having a thumb covering portion and a portion covering at least an index finger, said thumb covering portion and said index finger covering portion at least partially covering the thumb and the index finger, respectively, said hand cover further having a conjunction portion at an intersection of said thumb and index finger covering portions;

means for transmitting forces of said skier to said ski pole, said means for transmitting forces of said skier being affixed to said hand cover at said conjunction portion against substantial movement in any direction relative to said conjunction portion of said hand cover;

said means for transmitting forces of said skier to said ski pole further comprising:

first means for affixing said hand cover to said handle of said ski pole; and

second means for affixing said hand cover to said handle of said ski pole, said second means for affixing engaging said first means for affixing to permit the transmission of forces from said hand cover to said ski pole.

2. The apparatus of claim 1, wherein said hand cover comprises a glove.

3. The apparatus of claim 1, wherein said first affixing means is secured to said ski pole proximate said handle of said pole.

4. The apparatus of claim 1, wherein said hand cover includes means for adjusting the size of said hand cover to various sized skier hands.

5. The apparatus of claim 1, wherein said first means for affixing is arranged in said conjunction portion of said hand cover.

6. The apparatus of claim 1, wherein said means for transmitting forces comprises a strap forming a closed loop which is integrated into said hand cover.

7. The apparatus of claim 6, wherein said first means for affixing is arranged on said strap.

8. The apparatus of claim 7, wherein said first means for affixing is arranged on a part of said strap projecting toward said ski pole from said conjunction portion of said hand cover.

9. The apparatus of claim 8, further comprising means for adjusting the position of said first means for affixing with respect to said second means for affixing.

10. The apparatus of claim 1, wherein said first and second means for affixing are releasable from each other.

11. The apparatus of claim 1, wherein said means for transmitting forces includes a cuff adapted to encircle a wrist of said skier's hand.

12. The apparatus of claim 11, wherein said cuff is adjustable.

13. The apparatus of claim 12, wherein said cuff is open and includes two ends which are adapted to overlap each other.

14. The apparatus of claim 11, wherein said means for transmitting forces comprises a band that extends along the back of said hand and connects said second means for affixing to said cuff.

15. The apparatus of claim 11, wherein said means for transmitting forces comprises an extension that extends along a sharp edge of said hand to a band of said cuff.

16. The apparatus of claim 15, wherein said means for transmitting forces comprises a second band that extends along the palm of said hand and connects said second means for affixing to said extension.

17. The apparatus of claim 13, wherein means for gripping secures said two ends together.

18. The apparatus of claim 17, wherein said means for gripping comprises a loop and hook fastener.

19. A hand cover for a skier, adapted to be linked to a ski pole, said hand cover having a thumb covering portion and a portion covering at least an index finger, said thumb covering portion and said index finger covering portion at least partially covering the thumb and the index finger, respectively, said hand cover further having a conjunction portion at an intersection of said thumb and index finger covering portions, said hand cover further comprising:

means for transmitting forces of a skier to said ski pole;

means for affixing said transmitting means to said ski pole; and



means for restraining substantial movement of said transmitting means, in any direction relative to said hand covering, at said conjunction portion.

20. The hand covering of claim 19, wherein said means for transmitting forces extends from said conjunction portion to said affixing means.

21. The hand covering of claim 20, further having portions for covering the palm and back of the hand, wherein said transmitting means is at least partially positioned interiorly of said portions for covering the palm and back of the hand.

22. The hand covering of claim 21, wherein said transmitting means extends through said hand covering at said conjunction portion of said hand covering.

23. The hand covering of claim 22, wherein said means for affixing said transmitting means to said ski pole comprises means for releasably coupling said transmitting means to said ski pole.

24. The hand covering of claim 23, wherein said means for releasably coupling said transmitting means to said ski pole comprises a first means adapted to be affixed to said ski pole and a second means affixed to a predetermined part of said transmitting means, said second means further being releasably connectable to said first means.

25. The hand covering of claim 20, further having portions for covering the palm and back of the hand, wherein said transmitting means further comprises a predetermined portion which is securely affixed to said portions for covering the palm and back of the hand.

26. The hand covering of claim 25, wherein said transmitting means further comprises a cuff adapted to encircle a wrist.

27. The hand covering of claim 26, wherein said cuff includes a length adjusting means for adjusting the length to accommodate wrists of different circumferences.

28. The hand covering of claim 27, wherein said length adjusting means comprises a pair of overlapping bands adapted to encircle a wrist and means for positioning said pair of overlapping bands in a selectively variable position for accommodating wrists of different circumferences.

29. An apparatus for linking a ski pole, having a handle, to a hand of a skier, comprising:

a hand cover having a thumb covering portion and a portion covering at least an index finger, said thumb covering portion and said index finger covering portion at least partially covering the thumb and the index finger, respectively, said hand cover further having a conjunction portion at an intersection of said thumb and index finger covering portions;

means for transmitting forces of said skier to said ski pole, said means for transmitting forces comprising a cuff portion adapted to extend around the skier's wrist, a first band portion extending from said cuff portion and adapted to extend along the back of skier's hand, an extension portion which extends along an edge of said hand cover opposite said thumb covering portion, and a second band portion

extending from said cuff portion and adapted to extend along the palm of the skier's hand;

said means for transmitting forces of said skier to said ski pole further comprising:

first means for affixing said hand cover to said handle of said ski pole, said first means being attachable on said ski pole;

second means for affixing said hand cover to said handle of said ski pole, said second means for affixing being attached to said hand cover, said second means for affixing engaging said first means for affixing for permitting the transmission of forces from said hand cover to said ski pole, said second means for affixing being arranged at said conjunction portion of said hand cover to be restrained against substantial movement relative to said conjunction portion.

30. An apparatus for linking a ski pole, having a handle, to a hand of a skier, comprising:

a hand cover having means for transmitting forces of said skier to said ski pole, said hand cover being placed over the hand of said skier and including a cuff part;

said means for transmitting forces of said skier to said ski pole further comprising:

first means for attachment on said ski pole for affixing said hand cover to said handle of said ski pole;

second means on said hand cover for affixing said hand cover to said handle of said ski pole, said second means for affixing engaging said first means for affixing to permit the transmission of forces from said hand cover to said ski pole; and at least one band extending along the palm of the hand from said second means for affixing to said cuff part of said hand cover, said band being affixed against substantial movement relative to said hand cover along the length of said band.

31. An apparatus for linking a ski pole, having a handle, to a hand of a skier, comprising:

a hand cover having means for transmitting forces of said skier to said ski pole, said hand cover being placed over the hand of said skier and including a wrist part;

said means for transmitting forces of said skier to said ski pole further comprising:

first means for attachment on said ski pole for affixing said hand cover to said handle of said ski pole;

second means on said hand cover for affixing said hand cover to said handle of said ski pole, said second means for affixing engaging said first means for affixing to permit the transmission of forces from said hand cover to said ski pole; and a strap forming a loop which is integrated into and affixed against substantial movement along its length relative to said hand cover, said loop having two end strands connected to said wrist part, said two end strands passing along the palm of the hand.

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